

CLAIMS

What is claimed is:

1. A method of inhibiting epidermal melanocyte or keratinocyte cell loss comprising contacting epidermal melanocytes with a substance, wherein the substance is a neurotrophin, biologically active fragment thereof, or a nerve growth factor pseudo-ligand that binds to the p75 nerve growth factor receptor expressed on melanocytes and keratinocytes.
2. A method according to Claim 1 wherein the neurotrophin is selected from the group consisting of nerve growth factor, neurotrophin-3, neurotrophin 4/5 or brain-derived neurotrophic factor.
3. A method according to Claim 1 wherein the pseudo-ligand is a peptide comprising the amino acid sequence lysine-glycine lysine or lysine-glycine-alanine.
4. A method according to Claim 3 where in the peptide is selected from the group consisting of SEQ ID NO: 4, SEQ ID NO.: 9 and SEQ ID NO.: 10.
5. A peptide that inhibits p75 nerve growth factor receptor-mediated apoptosis wherein the peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO.:4, SEQ ID NO.:9 and SEQ ID NO.:10, and wherein the peptide has a cyclic conformation.
6. A method of inducing or maintaining hair growth in a vertebrate comprising inhibiting p75 nerve growth factor receptor-mediated apoptosis in follicular keratinocytes wherein apoptosis is inhibited by contacting the keratinocytes with a substance, wherein the substance is a neurotrophin, a biologically active

fragment thereof, or a nerve growth factor pseudo-ligand that binds to the p75 nerve growth factor receptor expressed on keratinocytes.

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A method according to Claim 7 wherein the pseudo-ligand is a peptide comprising the amino acid sequence lysine-glycine-lysine or lysine-glycine-alanine.

8. A method according to Claim 7 where in the peptide is selected from the group consisting of SEQ ID NO:4, SEQ ID NO.: 9 and SEQ ID NO.: 10.

9. A peptide according to Claim 8 wherein the peptide has a cyclic conformation.

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A method of maintaining or inducing hair color in a vertebrate comprising inhibiting p75 nerve growth factor receptor-mediated apoptosis in epidermal melanocytes wherein the apoptosis is inhibited by contacting the melanocytes with a substance, wherein the substance is a neurotrophin, a biologically active fragment thereof or a nerve growth factor pseudo-ligand that binds to the p75 nerve growth factor receptor expressed on melanocytes.

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A method according to Claim 10 wherein the pseudo-ligand is a peptide comprising the amino acid sequence lysine-glycine-lysine or lysine-glycine-alanine.

12. A method according to Claim 11 where in the peptide is selected from the group consisting of SEQ ID NO:4, SEQ ID NO.: 9 and SEQ ID NO.: 10.

20 13. A peptide according to Claim 12 wherein the peptide has a cyclic conformation.

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14. A method of inducing or maintaining skin color in a vertebrate comprising inhibiting p75 nerve growth factor receptor-mediated apoptosis in epidermal melanocytes wherein apoptosis is inhibited by contacting the melanocytes with a substance, wherein the substance is a neurotrophin, a biologically active fragment thereof or the pseudo-ligand is a nerve growth factor pseudo-ligand that binds to the p75 nerve growth factor receptor expressed on melanocytes.
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15. A method according to Claim 14 wherein the pseudo-ligand is a peptide comprising the amino acid sequence lysine-glycine-lysine or lysine-glycine-alanine.
- 10 16. A method according to Claim 15 where in the peptide is selected from the group consisting of SEQ ID NO:4, SEQ ID NO.: 9 and SEQ ID NO.: 10.
17. A method of treating alopecia areata in a vertebrate comprising inducing or maintaining hair growth in the vertebrate comprising inhibiting p75 nerve growth factor receptor-mediated apoptosis in keratinocytes by contacting the keratinocyte with nerve growth factor or a nerve growth factor pseudo-ligand, in an amount sufficient to inhibit apoptosis, that binds to a keratinocyte p75 nerve growth factor receptor, thereby inhibiting apoptosis, and maintaining hair growth.
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18. A method according to Claim 17 wherein the pseudo-ligand is a biologically active fragment of nerve growth factor, or the pseudo-ligand is a nerve growth factor pseudo-ligand that binds to the p75 nerve growth factor receptor.
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19. A method according to Claim 18 wherein the pseudo-ligand is a peptide comprising the amino acid sequence lysine-glycine-lysine or lysine-glycine-alanine.

20. A method according to Claim 19 wherein the peptide is selected from the group consisting of SEQ ID NO:4, SEQ ID NO.: 9 and SEQ ID NO.: 10.
- 5 ~~21.~~ A method of treating male pattern baldness comprising inducing or maintaining hair growth in the male comprising inhibiting p75 nerve growth factor receptor-mediated apoptosis in keratinocytes by contacting the keratinocyte with nerve growth factor or a nerve growth factor pseudo-ligand, in an amount sufficient to inhibit apoptosis, that binds to a keratinocyte p75 nerve growth factor receptor, thereby inhibiting apoptosis, and maintaining hair growth.
- 10 22. A method according to Claim 21 wherein the pseudo-ligand or a biologically active fragment of nerve growth factor, or the pseudo-ligand is a nerve growth factor pseudo-ligand that binds to the p75 nerve growth factor receptor.
- ~~23.~~ A method according to Claim 23 wherein the pseudo-ligand is a peptide comprising the amino acid sequence lysine-glycine-lysine or lysine-glycine-alanine.
- 15 24. A method according to Claim 23 wherein the peptide is selected from the group consisting of SEQ ID NO:4, SEQ ID NO.: 9 and SEQ ID NO.: 10.
- 20 ~~25.~~ For use in therapy, a substance that binds to the p75 nerve growth factor receptor which is expressed on the surface of melanocytes or keratinocytes, for example a neurotrophin or a fragment thereof; nerve growth factor or a fragment thereof or a nerve growth factor psuedo-ligand, the therapy being, for example, the control (e.g., induction or elimination) of hair growth and/or pigmentation.

26. The invention of Claim 25 wherein the therapy is:
- (a) the inhibition of epidermal melanocyte cell loss due to injury; or
 - (b) the control (e.g., induction or elimination) of hair growth and/or pigmentation wherein the substance is nerve growth factor, or a biologically active fragment thereof, or the pseudo-ligand is a nerve growth factor pseudo-ligand that binds to the p75 nerve growth factor receptor.
27. The substance of Claim 25 wherein the psuedo-ligand is, for example, a peptide having the amino acid sequence lysine-glycine-lysine or lysine-glycine-alanine.
28. The peptide of Claim 27 wherein the sequence is SEQ ID NO.:4, SEQ ID NO.:9 or SEQ ID NO.:10.
29. Use of a substance which binds to the p75 nerve growth factor receptor which is expressed on the surface of melanocytes or keratinocytes, for example, a neurotrophin or a fragment thereof, nerve growth factor or a fragment thereof; or a nerve growth factor psuedo-ligand, for the manufacture of a medicament for use in therapy, e.g., in the control (e.g., induction or elimination) of hair growth and/or pigmentation.
30. The invention of Claim 29 wherein the therapy is:
- (a) the inhibition of epidermal melanocyte cell loss due to injury; or
 - (b) the control (e.g., wherein the substance is nerve growth factor, or a biologically active fragment thereof, or the pseudo-ligand is a nerve growth factor pseudo-ligand that binds to the p75 nerve growth factor receptor).

31. The substance of Claim 29 wherein the substance is, for example, a peptide having the amino acid sequence lysine-glycine-lysine or lysine-glycine-alanine.
32. The peptide of Claim 31 wherein the sequence is SEQ ID NO.:4, SEQ ID NO.:9 or SEQ ID NO.:10.

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